



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Three new species of *Opuntia*, with a discussion of the identity of *Opuntia Lindheimeri*

BERNARD MACKENSEN

For some years the writer has been studying the opuntias growing in the country about San Antonio, Texas. Among the large, more or less erect forms he has recognized several species described by Dr. David Griffiths in recent years, but of the remaining large forms he has not been able to discover a record anywhere. Among the latter he naturally expected to recognize *Opuntia Lindheimeri*, but careful examination revealed the fact that no single form agrees with Dr. Engelmann's description of that species and with the specimens and notes ascribed to it in the herbarium of the Missouri Botanical Garden; nor has he been able to find such a form at New Braunfels, the type locality of that species.

Of the presumably new species mentioned, three are described below. A certain other species occurs here, characterized by robustness, its height sometimes exceeding two meters, and by its white to yellow spines (resembling bone), etc. Perhaps this species approaches the description of *O. Lindheimeri* more nearly than any other occurring in this region. The two, however, differ in length of bristles, length and color of spines, shape and character of fruit, and size and character of seed. The fruit preserved in the type material of *O. Lindheimeri*, and the sketch of it accompanying them, show that organ to be very slender. None of the larger opuntias of the type locality have such a fruit, so far as the writer has been able to determine, but the low species *Opuntia macrorhiza* and *O. leptocarpa* bear fruit of that form. Some of the type material was taken from plants grown in St. Louis and for that reason is probably not normal, as the opuntias are very readily modified by changed conditions. This fact, together with the unsatisfactory condition of a part of the material, increases the difficulty of establishing the identity of *Opuntia*

Lindheimeri. The seeds in the type material agree with those of *O. macrorhiza*. The writer had long suspected that this species is a composite one, but after his examination of the material and accompanying notes and drawing in the herbarium of the Missouri Botanical Garden he has become firmly convinced that such is the case. There is another fact which supports this view: Lindheimer, in his notes accompanying the specimens of opuntias, uses the expressions "kleine Opuntia" and "grosse Opuntia," which seems to indicate that he regarded all the small flat-jointed opuntias of his region as one species and all the large (more or less erect) ones as another, just as at present most of the inhabitants of that region distinguish but two species, if indeed they recognize more than one.

It would seem that in the composition of *O. Lindheimeri* the tall form mentioned contributed the size and habit, *O. texana* the spines, and *O. macrorhiza* the fruit. All these species occur at New Braunfels. The writer has thought best to let the tall form, of which he has deposited specimens under the number 619757 in the U. S. National Herbarium, stand for *O. Lindheimeri*.

The species described below are closely related, but each, it will be seen, differs from any one of the others in several characters. The descriptions were drawn from plants growing in their native habitat at San Antonio, Texas, where the species are common, and the type material was collected in the same locality.

***Opuntia convexa* sp. nov.**

Plants from somewhat fleshy terete roots, sometimes attaining a height of over 1 meter and a breadth of 2 to 3 meters, with normally erect or ascending stems; joints obovate to oval, often inequilateral and obtuse or acutish at apex, 1.5 to 3 cm. long, or sometimes longer, at first somewhat glaucous, later dull green, darker around the areoles, in age dirty yellow to gray, and scurfy; leaves subulate, somewhat flattened, 5 to 10 mm. long; areoles bearing formidable bristles and short wool, and on the younger joints usually armed, except the lowest; bristles dirty yellow to brown, on old joints widely spreading and attaining a length of 15 mm.; spines light brown to reddish below (soon fading to grayish), but the greater portion of spine pale yellow, straight or often curved, much flattened, mostly twisted, rather stout, unequal, 1 to 4.5 cm. long, or sometimes longer, 1 to 5 to an areole, or on

the older joints sometimes more, very numerous on joints formed in droughty seasons, erect or spreading, on old joints reflexed; flowers opening yellow and turning salmon pink, 7 to 8 cm. broad and long; petals relatively thick, obovate, cuspidate, about 3 cm. broad, 4 to 5 cm. long; stigma green, 7- to 9-lobed, surpassing the stamens; fruit obovate in outline, often broadly so, 3.5 to 4 cm. broad, 4.5 to 5.5 cm. long, dark purplish red without, purple within, the umbilicus convex, the taste nauseous; seeds suborbicular, nearly or quite 4 mm. in diameter, buff, with more or less gray on the flat sides.

The plant flowers in April and May and ripens its fruit, which is often proliferous, in August.

This species is probably the commonest of the various large-jointed prickly pears growing about San Antonio.

The type is no. 619756 in the U. S. National Herbarium.

***Opuntia Griffithsiana* sp. nov.**

Plants from somewhat fleshy terete roots, sometimes attaining a height of 8 and a breadth of 12 dm., with erect, ascending, and prostrate stems, forming a rather dense growth; joints obovate to oval (often broadly so) or circular, thin, 1.5 to 2.5 or sometimes 3 dm. long, the younger pale glaucous, the oldest dirty yellow to grayish, and scurfy; leaves subulate, from very short to 10 mm. in length; areoles bearing formidable bristles and short wool, and on the younger joints usually armed with spines, except below; bristles bright reddish brown when young, dirty yellow to brown when older, attaining on old joints a length of 12 mm.; spines brownish red to brown below (often to the middle), pale yellow or dirty white above, faded in age, straight or sometimes curved, somewhat flattened, mostly twisted, rather slender, unequal, 1 to 4.5 cm. long, or sometimes longer, 1 to 5 to an areole, or on the older joints sometimes more, very numerous on joints formed in droughty seasons, erect or spreading, or on old joints reflexed; flowers light yellow, turning darker (reddish) in center, 7 to 9 cm. broad, 8 to 10 cm. long; petals obovate to cuneate, often narrowly so, 2.5 to 4 cm. broad, 4.5 to 5 cm. long, sometimes emarginate, the midrib ending in a minute point; stigma green, usually 7- or 8-lobed, surpassing the stamens; fruit oblong-obovate to obovate, 3.5 to 4 cm. wide, 5 to 8 cm. long, dark purplish red without, the flesh purple and pale green, with a nauseous taste, the large umbilicus more or less depressed in the center; seeds suborbicular, 4 mm. in diameter, buff, with more or less gray on the flat sides.

The plant flowers in April and May and ripens its fruits, which are not proliferous, from August till winter.

The type is no. 619758 in the U. S. National Herbarium.

The species is named for Dr. David Griffiths, of the U. S. Department of Agriculture.

***Opuntia reflexa* sp. nov.**

Plants from somewhat fleshy terete roots, attaining a height of over 1 meter and breadth of over 2 meters, with erect, ascending, and often long prostrate branches; joints obovate to oval, often broadly so, the apex often obtuse or acutish, 1.5 to 3 dm. long, or sometimes longer, the younger gray-glaucous green, the older yellowish or bluish green, and finally dirty yellow or grayish, and scurfy; leaves subulate, from very short to 10 mm. in length; areoles remote, filled with bristles and short wool, unarmed or bearing 1 or 2 or sometimes 3, and on the older joints often a greater number of spines; bristles, when young, yellow to reddish brown, when older pale dirty yellow, often mottled with brown, on old joints widely spreading and attaining a length of 15 mm.; spines, when young, pale yellow, often mottled with brown or red, when older yellowish white, mostly tinged with red at base, much flattened, mostly twisted, usually very slender, unequal, from very short to 5 or sometimes 7 cm. long, usually much or wholly reflexed; flowers opening yellow and soon turning orange, 8 to 10 cm. broad, 8 to 9 cm. long; petals obovate, cuspidate, 3.5 to 4 cm. broad, 5.5 to 6 cm. long, often some of them reflexed; stigma green, usually 7- or 8-lobed, equaling or slightly surpassing the stamens; fruit obovate in outline, about 4 cm. broad and 5 to 6 cm. long, dark purplish red without, purple within, the umbilicus usually centrally depressed; seeds sub-orbicular to reniform with a prominent raphe, about 3 mm. long, grayish.

Flowering in April and May. The fruit ripens in August and September and is unpalatable and non-proliferous.

The type is no. 619754 in the U. S. National Herbarium.

SAN ANTONIO, TEXAS.